

(p.32). The next paper by Thomas Brante explores an alternative conception of moral discourse. He argues for understanding values as more complex and dynamic than those assuming ethics as universal entities: "morality must not be regarded as a relationship between an autonomous individual and a belief system, but to incorporate social factors as crucial elements of all moral discourse" (p.53). This sort of discussion in texts on science, technology and society will help us begin the urgent task of reconsidering the fact-value separation in science.

Comparing the two volumes, and by implication the conferences which lie behind their production, on the one hand in Dubrovnik there was a commitment to maintaining controversy and negotiation — a determination to prevent things from becoming settled. This strategy seems to be based on the understanding that the tackling of the moral and ethical issues implicit in the workings of the science/technology system is only feasible when a fluid situation is maintained. On the other hand, in the Leeds conference proceedings we have the assertion that open-mindedness, good intentions and good technique are the tools with which to oppose the technocratic trend. As a practitioner in the study of science and technology, I feel more comfortable with the first option.

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Beyond The Technology Race: An Analysis of Technology Policy in Seven Industrial Countries by *Annemieke J.M. Roobeek*

(Elsevier Science Publishing, New York, 1990), pp. xiii + 269, \$US92.25, ISBN 0-414-86637-0.

The author explains first the theoretical framework of the study which covers Japan, the United States, the Federal Republic of Germany, the United Kingdom, France, Sweden and the Netherlands. The issue of government intervention in the development of technology is dealt with in a comprehensive manner. The author juxtaposes the *laissez faire* policy of Adam Smith against Alexander Hamilton's theory of state intervention in the industrial process which cannot be guaranteed by the market alone. Different phases of post-war technology policy have been explained in their aspects of restructuring particularly those of Japan and Western Europe as they challenged America's dominance in industrialisation. By 1979 the author claims that all seven countries were aiming at developing innovation in the so-called 'core' technologies, like microelectronics, robotics and computers.

The author goes on to describe the progress of technological innovations in clusters which bring about long-term change. Economic theory is unable to grapple with establishing a realistic relationship between technology and the economy. The techno-economic paradigm is used to construct a conceptual framework of webs around and within which relationships are established.

The third chapter of the book has an interesting and useful analysis of Fordism as a politico-economic framework for post-war industrial development. The inherent problems of control within Fordism are described and contrasted with the Keynesian belief that policy should control the economy. The concept of

economies of scope is introduced as an outcome of information technology. With an extensive use of tables to illustrate the control problems in Fordism the author claims that new technologies undermine the basic premises of the Fordist model.

The current technology race is considered by Roobeek as the cause for global competition which in turn legitimises greater government intervention. Each of the seven countries is consistently increasing its expenditure on R&D no matter what the political ideology or the business cycle of the economy. The success of MITI's planning in Japan is used as a case in point. The problems and strengths of joint technology policies in the European Economic Community are also examined. The author is critical of the overemphasis on technology as overriding other innovative processes.

International differences in innovative capability are examined carefully and at length with the use of graphs and GNP tables to analyse the government expenditures on R&D as a percentage of total national income. In analysing the unequal industrial economic base, production and employment rates by sector examined and then differences in productivity and shifts in world export shares of technology-intensive products are incorporated.

The last two chapters of the book concentrate on the political and social base of technology policy which are deemed as the "forgotten dimension". Beginning with a critique of the work of Kenichi Ohmae, the author emphasises the role of social institutions as providing a distinct environment which is contradictory to Ohmae's premise of a global consumer. He refutes the theory that homogenisation of demand emerges in capitalist countries as a result of technology policies. The author also criticises Roger's theory of innovations on the grounds that it does not deal with social institutions and their macroeconomic effects. This is followed by a typology of industrialised countries that establishes a link between structural differences and policy choices. Post-war policies of West Germany are cited as an example and compared to those followed in other advanced countries. An international comparison of policy instruments is also contained in the same chapter.

The author concludes that "the challenge for the 1990s" is to give a whole new dimension to technology policy and redefine it to bring about an "integrative, overall restructuring". Roobeek concedes, however, that it will be some time before the international technology race is given priority on the political agenda, and yet if we look at the Green Paper on Europe's telecommunications policy, it deals comprehensively with just that topic for the integration of European markets in 1992. This book contains a wealth of knowledge on technology policy which is presented in a clear and concise manner. Comparisons between seven countries could have led to some confusion but with the aid of graphs and tabulation, the analysis is clear and succinct. The interdisciplinary approach of the work makes it comprehensible to academics and policy makers. It makes useful reading for review of industrialisation in leading OECD countries and for current information on technology policies.

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